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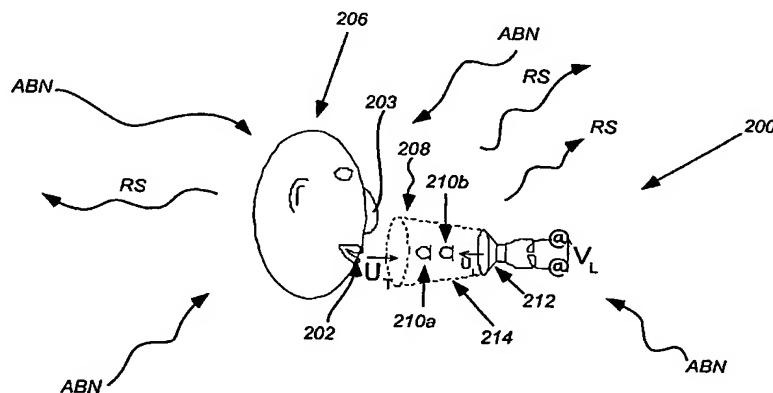
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(54) Title: METHOD AND APPARATUS FOR SOUND TRANSDUCTION WITH MINIMAL INTERFERENCE FROM BACKGROUND NOISE AND MINIMAL LOCAL ACOUSTIC RADIATION



(57) Abstract: A transducer senses sounds produced by a talker or other source and measures acceleration of air. Enhancement of acceleration is accompanied by reduction of the portion of the sound energy that escapes from the regions around the transducer. The result is a high sensitivity transducer, with increased privacy for use in communication systems, especially cell phones and in a multi-person environment. A pressure sensor array with a weighted output is sensitive to sound from a source talker only, and not to acoustic background noise, and not to a local loudspeaker. The weighted signal is a source sum pressure signal. The array produces a signal (using a different weighting) that corresponds to an estimate of a derivative of pressure. The derivative signal is proportional to the volume velocity fluctuations produced by the source. This signal is enhanced, rather than reduced. A local loudspeaker is driven to make the source sum pressure signal as small as desired. The loudspeaker is driven to produce volume velocity fluctuations approximately equal and opposite to those produced by the source. No compression of air arises due to the talker, and no sound is radiated into the far field. All happens because the system is driven to reduce the source pressure sum signal to below a desired threshold. It is not necessary to directly measure the volume velocity fluctuations of the talker source.

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